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INTEROFFICE MEMORANDUM

DATE: November 7, 1997

TO: Ron Heitland, B123 Project Manager, Bldg. T891C, X2862

FROM: D. R. Swanson, Authorization Basis Manager, Bldg. T893B, X7009

SUBJECT: AUDITABLE SAFETY ANALYSIS FOR THE BUILDING 123 DECONTAMINATION AND DECOMMISSIONING (D&D) PROJECT - DRS-077-97

This memorandum replaces in it entirety interoffice memorandum DRS-058-97, *Auditable Safety Analysis Review for the Building 123 Decontamination and Decommissioning (D&D) Project*, dated August 19, 1997. This update was required to incorporate comments from the October 1997 review, incorporate changes to documents previously reviewed, and incorporate the receipt of additional information. No additional controls were required as a result of the review comments, document changes and receipt of additional information, but the hazard categorization of the facility has been changed to *Radiological* from *Industrial*.

This memorandum has been prepared in response to a request for an authorization basis review of the Building 123 Decontamination and Decommissioning (D&D) Project. Review of the project was based on information provided which included: (1) *Proposed Action Memorandum for the Decommissioning of Building 123*, RF/RMRS-97-012, Revision 4, August 21, 1997; (2) *Reconnaissance Level Characterization Report for Building 123*, RF/RMRS-97-021, October 1997; (3) *Building 123 Decommissioning Project Health and Safety Plan*, RF/RMRS-97-022, Revision 0, June 1997; and *Waste Management Plan Building 123*, RF/RMRS-97-0021, June 1997. In addition, the *Building 123 Radiological Health/Analytical Laboratories Facility Safety Analysis (FSA)*, Revision 0, April 1997, was reviewed. The FSA is included in the Site Safety Analysis Report (Site SAR) as the authorization basis for Building 123 and is at DOE awaiting final approval.

The scope of this review covers those activities occurring after personnel relocation from the facility, the removal of any process or bulk chemicals in the facility or in the cargo containers, and the removal of any low level waste generated during the relocation activities. These activities were all in progress prior to the authorization basis review being requested. It is presumed that controls specified in the HASP and Site procedures were adhered to during accomplishment of these activities.

Facility Classification Criteria

DOE-EM-STD-5502-94, *Hazard Baseline Documentation*, establishes uniform Office of Environmental Management (EM) guidance on hazard baseline documents that identify and control radiological and non-radiological hazards for all EM facilities. The standard provides a "road map" to the safety and health hazard identification and control requirements contained in DOE Orders and provides EM guidance on the applicability and integration of these requirements. The standard includes: (1) the definition of four classes of facilities (nuclear, non-nuclear, radiological, and other industrial facilities; (2) the thresholds for facility hazard classification; and (3) the applicable safety and health identification, controls and documentation. The thresholds for facility hazard classification are:

- Nuclear Facility Hazard Category 3 thresholds per DOE Order 5480.23, *Nuclear Safety Analysis Reports* and DOE-STD-1027-92, *Hazard Categorization and Accident Analysis Techniques for Compliance with DOE Order 5480.23, Nuclear Safety Analysis Reports*,
- Reportable Quantities (RQs) per 40 CFR 302, *Designation, Reportable Quantities, and Notification*.
- Threshold Quantities (TQs) per 29 CFR 1910.119, *Process Safety Management* (PSM) and 40 CFR 68, *Risk Management Programs (RMP) for Chemical Accidental Release Prevention*,
- Threshold Planning Quantities (TPQs) per 40 CFR 355, *Emergency Planning and Notification*, and

DOE Order 5480.23 is the primary Order governing safety analysis requirements for nuclear facilities. Facilities are designated as "Nuclear Facilities" if the radiological inventory exceeds the threshold values in DOE-STD-1027-92. DOE-STD-1027-92 identifies the threshold between a Category 3 Nuclear Facility and a below Category 3 Nuclear Facility as a comparison of the total segmented inventory with the values in the standard.

The RQs in 40 CFR 302,Table 302.4, *List of Hazardous Substances and Reportable Quantities*, and Appendix B, *Radionuclides*, are used to establish the dividing line between radiological or non-nuclear facilities and industrial facilities. The levels in 40 CFR 302 are based on the RQs in pounds of material for hazardous substances and curies of materials for radioactive substances. RQs are based on the potential release of materials into the environment.

The basis for the application of the PSM Standard, 29 CFR 1910.119, and the RMP Rule, 40 CFR 68, is the inventory quantity of hazardous substances determined by gross amounts (unadjusted by process) of hazardous materials. The PSM Standard was promulgated to prevent and mitigate the effects of major accidents at chemical facilities that could result in loss of life to workers. The RMP Rule was promulgated to prevent and mitigate the effects of accidental releases of hazardous materials that could affect public health and/or the

environment. Exceeding TQ levels specified in 29 CFR 1910.119 or 40 CFR 68 triggers PSM and RMP respectively and classifies the facility as either *radiological* or *non-nuclear*.

The TPQ levels in 40 CFR 355 are used to determine whether or not emergency planning and release notification are required based on an airborne release of any listed chemical. The TPQ levels are used if the chemicals in question are not listed in 29 CFR 1910.119. Exceeding TPQs in 40 CFR 355 triggers compliance with emergency planning and release notification requirements and classifies the facility as either *radiological* or *non-nuclear*.

If none of the above mentioned thresholds are exceeded based on chemical and radiological inventories, an *Industrial* facility classification can be assigned.

Building 123 Classification

Based upon a review of the above information, there are areas within Building 123 with radioactive contamination levels exceeding 40 CFR 302.4, Appendix B RQ levels but below the levels specified in DOE-STD-1027-92. The following were identified as potential radiological contamination sources:

- Radioactive contamination has been found in various rooms throughout Building 123. Specific areas with radioactive contamination are outlined in the *Reconnaissance Level Characterization Report for Building 123*. The survey results indicated there are no areas within Building 123 which have significant amounts of unidentified/uncontrolled/unmarked radioactive contamination. Table 3-3 in the Reconnaissance Level Characterization Report provides a radiological survey summary which shows five rooms (Rooms 105, 106, 109, 123A and 125) are above the unrestricted release limits. The contamination in these rooms is considered fixed contamination. It is assumed the quantity of radioactive material in the building exceeds the 40 CFR 302.4, Appendix B RQ levels since the lowest RQ for radionuclides that could potentially be in the building is 0.001 Ci (Ga-148) and the RQ for Pu-239 is 0.01 Ci. Segmentation of the facility inventory of radioactive material is provided by the building rooms and by the D&D process for packaging and removing radioactive waste from the facility. During the decontamination process, each of the contaminated rooms will be decontaminated and the radioactive material will be packaged as low level waste (LLW). The LLW will be certified by Kaiser-Hill Waste Certification and then delivered to RMRS Waste Operations (removed from the facility) for storage prior to future offsite disposal. There will be no significant build-up of waste container inventory either within or adjacent to the building. This provides assurance that the quantity of radioactive materials in each facility segment will not exceed the DOE-STD-1027-92 threshold levels.

- Various isotopes of plutonium, americium, uranium, and curium were transferred as process waste from Building 123. The process waste system has been designated, per the Comprehensive . Environmental Response and Liability Act (CERCLA) as Individual Hazardous Substance Site (IHSS) 121. IHSS 121 consists of Resource Conservation and Recovery Act (RCRA) Unit 40 underground process waste lines which transferred the process waste. One of the process waste lines has been identified as an area of reported release. Another IHSS, IHSS 148, is located beneath Building 123 and was established as a result of reported small spills of nitrate-bearing wastes along the east side of the building. These spills may also be the result of leaks in the process waste line. A complete characterization of the IHSS's has not been completed. Prior to removing the Building 123 slab, a radiological survey of the area will be performed.

The FSA classification of Building 123 was *Non-nuclear, Moderate* since RQ and TPQ levels were exceeded due to chemicals used and stored in the facility. The FSA identified hydrochloric acid, hydrofluoric acid, and nitric acid as chemicals of concern in Building 123. The hydrofluoric acid and nitric acid levels exceeded 40 CFR 302.4, Table 302.4 RQ and 40 CFR 355 TPQ levels. The hydrofluoric acid and nitric acid were contained in 0.5-liter plastic bottles and 1-gallon glass bottles respectively and were stored in outside storage units (cargo containers). The hydrochloric acid exceeded the Emergency Preparedness Screening Threshold (EPST) level, was contained in 1-gallon glass bottles, and was stored outside in the cargo containers and inside in Room 103. These chemicals have been removed from the building and the cargo containers to quantities below TPQ, RQ and EPST levels. Other chemicals removed from the facility include oxalic acid, ammonium hydroxide, formic acid, perchloric acid, toluene, isopropyl alcohol, ammonium thiocyanate, methanol, mercury, lead, cadmium, beryllium, sodium hydroxide, and potassium permanganate.

Other hazardous materials identified in the building are asbestos containing material, crystallized perchloric acid in hoods, beryllium, polychlorinated biphenyls (PCBs), RCRA hazardous waste in Satellite Accumulation Areas (SAAs), and pressurized gas cylinders/liquid nitrogen. The presence of these hazardous materials is considered a standard industrial hazard. Actions have been identified for each of the hazardous materials as follows:

- Asbestos abatement will occur after personnel are relocated from the facility and prior to beginning decommissioning of the building. An Integrated Work Control Plan (IWCP) will be developed to specify the activities required and the HASP identifies the necessary controls.
- Special precautions have been identified for the removal of potential crystallized perchloric acid in the perchloric acid hoods. The HASP specifies controls for this hazard.
- Two of the 39 areas sampled indicated beryllium contamination. The levels of beryllium present in the samples is below the RFETS site housekeeping level of 25 $\mu g/ft^2$ as specified in 1-15310-HSP-13.04.

- Light ballasts have the potential for containing PCBs. The light ballasts will be further evaluated prior to decommissioning to see if they contain regulated amounts of PCBs. Should the ballasts contain regulated amounts of PCBs the decommissioning contractor will remove the ballasts from the building and RMRS Waste Management will package and ship the ballasts.
- RCRA hazardous waste was generated by operations in the rooms in which it is stored. The RCRA hazardous waste in the Satellite Accumulation Areas (SAAs) will be characterized by process knowledge, packaged, labeled, and shipped for storage or disposal prior to closing the accumulation areas.
- The pressurized gas cylinders used by the laboratories are being transported to where the laboratory personnel are relocated. The liquid nitrogen system will be disconnected and removed as part of the D&D effort.

Based upon the information received and reviewed, the activities associated with the Building 123 D&D are above 40 CFR 302, Appendix B RQs but less than the thresholds specified in DOE-STD-1027-92 for Pu-239, therefore the facility is categorized as a *Radiological Facility* per DOE-EM-STD-5502-94, *Hazard Baseline Documentation*. This determination is based on the quantities of radiological material anticipated to be handled during D&D activities and the segmentation of the material in its current form in the building and during the decontamination process. The D&D activities for Building 123 present minor onsite and negligible offsite impacts to people and the environment per DOE-EM-STD-5502-94 criteria. However, the suspected radiological and chemical material amounts associated with this project do present safety risk to immediate workers who will be performing the work.

The safety documentation required for a *Radiological Facility*, per DOE-EM-STD-5502-94, includes an Auditable Safety Analysis (ASA) and a site-specific HASP. This document satisfies the requirements for an ASA.

Recognized Project Controls

The Building 123 Decommissioning Project HASP addresses control of radiological and chemical hazards to workers from suspect contaminants and compliance with applicable OSHA standards. Actions specified in Figure 4-1 of the Building 123 Health And Safety Plan (HASP) provide the necessary controls for the radioactive material that will be encountered by workers during D&D activities. These controls include: (1) ensuring all workers are properly trained, medical requirements are established, personal protective equipment (PPE) is defined, and radiation prerequisites are met prior to beginning the activity; (2) developing and implementing an Activity Hazard Analysis (AHA) for the activity; (3) performing air and smear monitoring sampling; and (4) having available and following the Radiation Work Permit. Controls concerning training, waste packaging and waste certification specified in the Waste Management Plan for the radioactive and hazardous materials in the facility are also applicable.

An assessment by the RMRS Authorization Basis organization will be required if hazardous substances (chemicals) are discovered in the facility during D&D activities whereby the RQ values specified in 40 CFR 302, Table 302.4 are exceeded. In addition, no hazardous substances may be brought onto the site during D&D activities exceeding the RQ values specified in 40 CFR 302, Table 302.4.

Conclusion

This analysis is based upon conditions identified in the referenced documents. If an unanticipated hazard or condition develops, and an evaluation determines the operational controls are not sufficient to adequately address the new circumstances, a new authorization basis may be required. The RMRS Authorization Basis Manager should be contacted if this situation occurs. After characterization of the IHSS's, the RMRS Authorization Basis Manager needs to be contacted to provided hazard categorization of that phase of the project.

Please direct any questions or concerns regarding this memorandum to myself or Ken Baier at X2852.

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